December 31, 2002

Nabnasset Lake Preservation Association
c/o Mr. Dan Doherty
16 Byrne Avenue
Westford, MA 01886

Re: Bathymetry Survey of Nabnasset Lake

Dear Dan:

Please accept this as our report/documentation for the Bathymetry Survey of Nabnasset Lake. Aquatic Control's Environmental Engineer, assisted by a Field Technician, conducted the water depth survey of Nabnasset Lake on November 26th. Measurements were taken from our 18-foot Jon Boat utilizing both a calibrated wooden rod and an electronic depth finder. Approximately 190 depth measurements (See Figure 1) were taken across the lake area along a series of pre-determined transects. Geographical location along with measured data was recorded using a Trimble XRS Differential Global Positioning System.

A water level benchmark was taken at the outlet structure. On the day of the survey the water's surface was 168.5 feet, which is approximately 0.9" below the normal summer elevation of the lake. Depth measurements were adjusted accordingly to make the bathymetry map representative of normal summer conditions.

Figure 2 & 3 show the resultant bathymetry of Lake Nabnasset as contour lines and contour shadings, respectively. The following table shows the approximate surface area of the lake with each of the respective contour lines.

Depth Contour (feet)	Area (acres)	% of entire lake
0	124.7	100
2	120.5	96.6
4	116.4	93.3
6	111.2	89.2
8	105.6	84.7
10	99.6	79.9
12	93.8	75.2
14	74.4	59.7
16	62.2	49.9
18	55.7	44.7
20	42.6	34.2
22	27.4	22.0
24	9.9	8.0

Data Limitations

The accuracy of the figures provided is limited by the discrete number of data points collected during the survey. The number of data points provide a reasonably accurate bathymetry of Nabnasset Lake however, it is certainly possible that some areas of depth variation and/or localized minimum/maximum water depths were not observed.

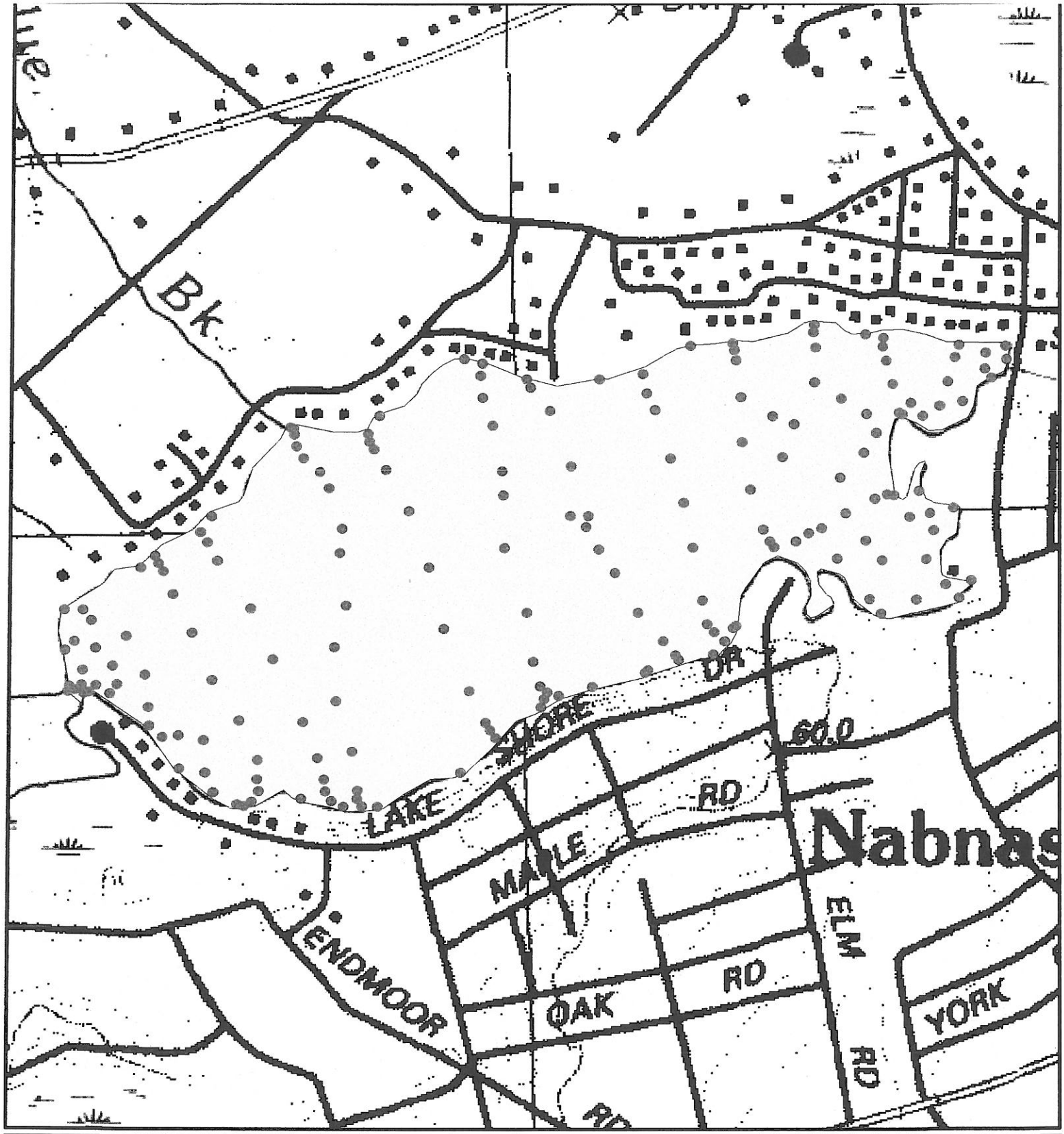
Additionally, we cannot be certain of drainage patterns or ability to dewater certain areas of the lake under drawdown. Small variations in water depths may create isolated areas of standing water and/or prevent significant areas of the pond from draining completely. The bathymetry maps are produced for information purposes only and are not intended for navigation.

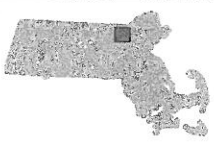
We hope this information proves useful to the Association in making future decisions regarding management of the lake. If you have any questions or comments, please feel free to call.

Sincerely,
AQUATIC CONTROL TECHNOLOGY, INC.

Dominic Meringolo

Dominic Meringolo
Environmental Engineer





N
W E
S

Nabnasset Lake

Westford, MA

Data Points

FIGURE	SURVEY DATE	MAP DATE
1	11/26/02	12/31/02

LEGEND

● Data Point

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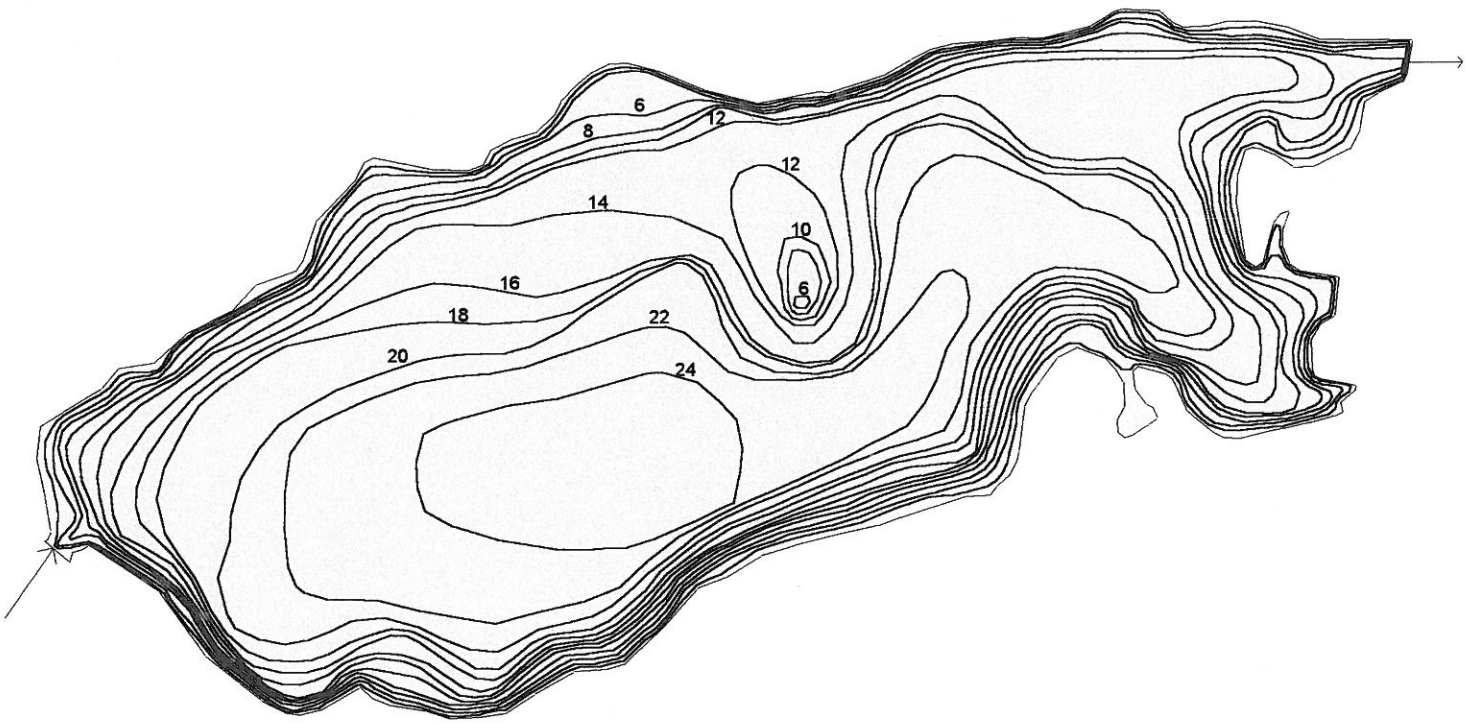

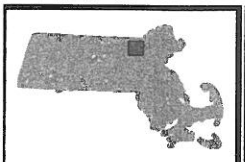

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Nabnasset Lake

Westford, MA

Bathymetry (Line)

FIGURE	SURVEY DATE	MAP DATE
2	11/26/02	12/31/02

LEGEND

Contour Interval : 2-Feet

Not intended for navigational purposes

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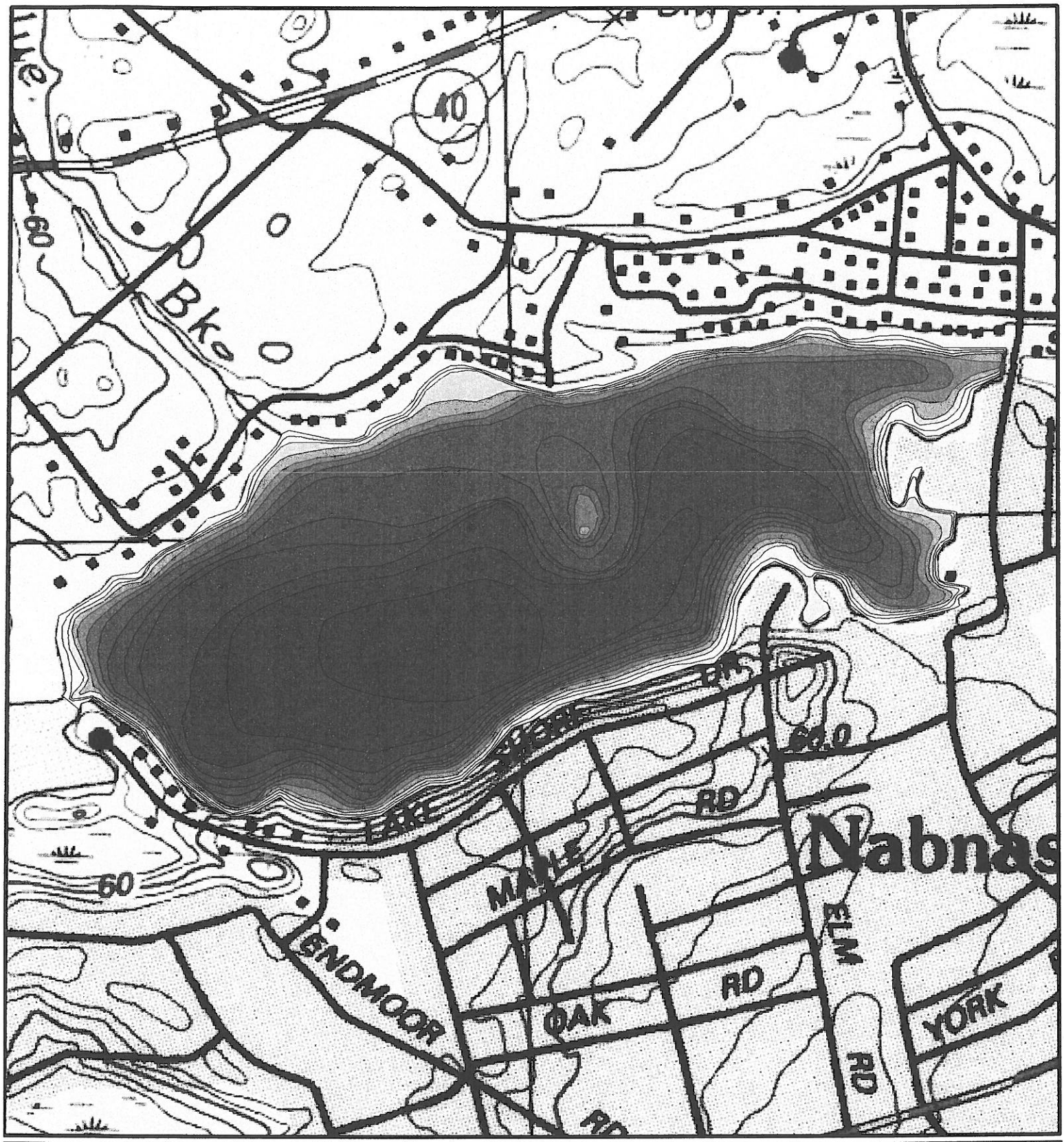

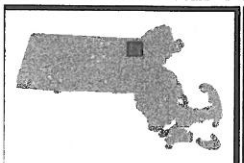

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Nabnasset Lake

Westford, MA

Bathymetry (Shaded)

FIGURE	SURVEY DATE	MAP DATE
3	11/26/02	12/31/02

LEGEND

- 0 - 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- 10 - 12
- 12 - 14
- 14 - 16
- 16 - 18
- 18 - 20
- 20 - 22
- 22 - 24
- 24 - 26

Not intended for navigational purposes

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334-1233

Main Identity

From: "Carl Nielsen" <cnielsen@essgroup.com>
To: "David Brody" <DSBrody@comcast.net>
Sent: Friday, August 06, 2004 4:54 PM
Subject: NLPA - Drawdown Monitoring

David,

ESS was able to complete the drawdown monitoring program on August 3rd, 2004 as required by the Order of Conditions (DEP File No. 334-1233) and outlined under item number 25 tasks B through E. As you know, the results of the water quality testing will not be available to ESS until sometime in mid-August and our final report will be available shortly thereafter. However, based on the data collected in the field and the results of the plant plot monitoring and macroinvertebrate survey, as well as the mussel survey that ESS performed for you earlier this spring, I believe that there is not any evidence that Nabnasset Lake or its flora or fauna have suffered unexpected, undue, or irreparable harm as a result of the targeted 6 foot winter drawdown that occurred over the winter of 2003-2004. To so support this statement I offer the following observations:

1. Water clarity was excellent (>3.5 meter Secchi disk depth) indicating that the drawdown did not result in any degredation of water clarity as a result of suspended nutrients, sediments, or from the loss of a portion of the filter-feeding mussels that were found to be stranded in shallower coves.
2. Milfoil was not found on any of the surveyed transects in the pond or in the shallow waters of Shipley Swamp. Milfoil was abundant in the deep waters of the swamp that were not affected by the drawdown.
3. Plant Plot data collected was not conclusive given that the plots established in 2002 were sampled in April and these were sampled in August. ESS believes the August date is the most appropriate and should be maintained if future monitoring is required. There was no evidence of an expansion of the purple loosestrife population, however, this expansion would be likely to occur with or without the drawdown since this plant is a very aggressive conlonizer.
4. Macroinvertebrates found in the swamp in 2004 were much more plentiful and diverse (based on our initial inspection) than they were when sampled in 2002. Certainly there is no evidence that the macroinvertebrate population has been harmed.
5. Plant diversity in Nabnasset Lake and in Shipley Swamp was relatively similar to that observed in 2002 and in previous studies. Even in waters of less than 6 foot of depth, the native plant community has survived in many areas of the lake and in nearly all areas of the swamp. Survivorship of native plants in the mucky soils of the swamp was very high since the mucky soils were unlikely to have dewatered sufficiently for thorough freezing, which is the means by which a winter drawdown is able to kill plant roots.

Based on this initial set of observations ESS does not see any problem with continuing to perform the bi-annual winter drawdowns of Nabnasset Lake, however, we do recommend that monitoring continue to be performed on an annual to bi-annual basis. A full report will be submitted following receipt of the water quality testing results from the laboratory. Thank you again for allowing ESS to continue to serve your organization on this very successful project.

Carl Nielsen
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ESS Group, Inc.